

We claim:

1. A suspension system for a seat on a vehicle, the suspension system comprising:

5 a first frame member;

a second frame member connectable to the seat and coupled to the first frame member, the second frame member being movable relative to the first frame member;

10 a suspension member coupled to both the first frame member and the second frame member, the suspension member suspending the second frame member above the first frame member;

an adjustment mechanism coupled to the suspension member and manually manipulatable by an operator to adjust the stiffness of the suspension;

15 a handle to facilitate manual manipulation of the adjustment mechanism, the handle being movable along a portion of the adjustment mechanism between a first position and a second position; and

an engaging member resiliently resisting movement of the handle between the first position and the second position.

20 2. The suspension system of claim 1, wherein the handle is rotatable to adjust the stiffness of the suspension and is slidable along the portion of the adjustment mechanism between the first and second positions.

25 3. The suspension system of claim 1, wherein a majority of the handle is positioned under the seat in the first position, and wherein less of the handle is positioned under the seat in the second position than in the first position.

4. The suspension system of claim 1, wherein the adjustment mechanism includes a threaded rod.

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5. The suspension system of claim 4, wherein the engaging member engages threads of the threaded rod to resiliently resist movement of the handle between the first and second positions, such that the handle does not move between the first and second positions unless external forces in excess of the weight of the handle are applied to the handle.

6. The suspension system of claim 1, wherein the engaging member is a leaf spring.

7. The suspension system of claim 1, wherein the adjustment mechanism is a threaded rod, and wherein the engaging member is a leaf spring that resiliently engages threads of the threaded rod and deflects upon the application of external forces.

8. The suspension system of claim 1, wherein the handle is rotatable to facilitate rotation of the adjustment mechanism to adjust the stiffness of the suspension, and wherein the handle defines a polygonal cavity therein, and wherein the adjustment mechanism includes a polygonal surface positioned in the polygonal cavity of the handle and shaped complementary to the polygonal cavity of the handle, such that rotation of the handle causes rotation of the adjustment mechanism in a similar direction, and wherein the engaging member is positioned in the polygonal cavity of the handle and engages the adjustment mechanism to resiliently resist movement of the handle between the first and second positions, such that the handle does not move between the first and second positions unless sufficient external forces are exerted on the handle, the sufficient external forces being in excess of the weight of the handle.

9. The suspension system of claim 8, wherein the engaging member includes a resisting portion, a first non-resisting portion positioned on a first end of the resisting portion and a second non-resisting portion positioned on a second end of the resisting portion, the resisting portion is operable to resiliently engage the polygonal surface of the adjusting mechanism and resist movement of the handle between the first and second positions, the handle is in the first position and resisted from moving from the first position when the polygonal surface of the adjusting mechanism is aligned with the first non-resisting portion and is in the second position and resisted from moving from the second position when the polygonal surface of the adjusting mechanism is aligned with the second non-resisting portion.

10. The suspension system of claim 1, wherein the handle is rotatable to facilitate rotation of the adjustment mechanism to adjust the stiffness of the suspension, and wherein the handle defines a hexagonal cavity therein, and wherein the adjustment mechanism includes a hexagonal surface positioned in the hexagonal cavity of the handle and shaped complementary to the hexagonal cavity of the handle, such that, rotation of the handle causes rotation of the adjustment mechanism in a similar direction, and wherein the engaging member is positioned in the hexagonal cavity of the handle and engages the hexagonal surface to resiliently resist movement of the handle between the first and second positions, such that, the handle does not move between the first and second positions unless sufficient external forces are exerted on the handle, the sufficient external forces being in excess of the weight of the handle.

11. The suspension system of claim 1, wherein the handle is rotatable to facilitate rotation of the adjustment mechanism to adjust the stiffness of the suspension, and wherein the handle defines a cavity therein, and wherein the adjustment mechanism includes a nut positioned in the cavity of the handle, the nut being shaped complementary to the shape of the cavity, such that, rotation of the handle causes rotation of the adjustment mechanism in a similar direction, and wherein the engaging member is positioned in the cavity of the handle and engages the nut to resiliently resist movement of the handle between the first and second positions, such that the handle does not move between the first and second positions unless sufficient external forces are exerted on the handle, the sufficient external forces being in excess of the weight of the handle.

12. A suspension system for providing suspension to a seat on a vehicle, the suspension system comprising:

a first frame member;

5 a second frame member connectable to a seat and coupled to the first frame member, the second frame member being movable relative to the first frame member;

10 a suspension member coupled to both the first frame member and the second frame member, the suspension member suspending the second frame member relative to the first frame member and resisting movement of the second frame member relative to the first frame member;

a threaded rod threadably coupled to the suspension member and being rotatable to preload the suspension member;

a handle coupled to the threaded rod to facilitate rotation of the threaded rod, the handle being slidable relative to the threaded rod; and

15 an engaging member resiliently engaging the threaded rod and resiliently resisting sliding of the handle relative to the threaded rod.

13. The suspension system of claim 12, wherein the engaging member is a leaf spring.

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14. The suspension system of claim 12, wherein the engaging member engages threads of the threaded rod to resiliently resist sliding of the handle relative to the threaded rod, such that the handle does not slide relative to the threaded rod unless sufficient external forces are exerted on the handle, the sufficient external forces being in excess of the weight of the handle.

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15. The suspension system of claim 12, wherein the engaging member is a leaf spring that resiliently engages threads of the threaded rod and deflects upon the application of external forces.

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16. The suspension system of claim 12, wherein the handle defines a polygonal cavity therein, and wherein the threaded rod includes a polygonal surface positioned in the polygonal cavity of the handle and shaped complementary to the polygonal cavity of the handle, such that rotation of the handle causes rotation of the threaded rod in a similar direction, and wherein the engaging member is positioned in the polygonal cavity of the handle and engages the threaded rod to resiliently resist sliding of the handle relative to the threaded rod, such that the handle does not slide relative to the threaded rod unless sufficient external forces are exerted on the handle, the sufficient external forces being in excess of the weight of the handle.

17. The suspension system of claim 16, wherein the engaging member includes a raised portion, a first flat portion positioned on a first end of the raised portion and a second flat portion positioned on a second end of the raised portion, the raised portion is operable to resiliently engage the polygonal surface of the threaded rod and resist sliding of the handle relative to the threaded rod, the raised portion deflects upon the application of external forces to allow the polygonal surface to slide relative to the threaded rod.

18. The suspension system of claim 12, wherein the handle defines a hexagonal cavity therein, and wherein the threaded rod includes a hexagonal surface positioned in the hexagonal cavity of the handle and shaped complementary to the hexagonal cavity of the handle, such that rotation of the handle causes rotation of the threaded rod in a similar direction, and wherein the engaging member is positioned in the hexagonal cavity of the handle and engages the threaded rod to resiliently resist sliding of the handle relative to the threaded rod, such that the handle does not slide relative to the threaded rod unless sufficient external forces are exerted on the handle, the sufficient external forces being in excess of the weight of the handle.

19. A suspension system for a seat on a vehicle, the seat being pivotal relative to the vehicle between a substantially horizontal position and a non-horizontal position, the suspension system comprising:

a first frame member;

5 a second frame member connectable to the seat and coupled to the first frame member, the second frame member being movable relative to the first frame member, the second frame member being pivotal with the seat between the substantially horizontal position and the non-horizontal position;

10 a suspension member coupled to both the first frame member and the second frame member, the suspension member suspending the second frame member relative to the first frame member and resisting movement of the second frame member relative to the first frame member;

15 a threaded rod threadably coupled to the suspension member and being rotatable to adjust the stiffness of the suspension member, the threaded rod being pivotal with the seat between the substantially horizontal position and the non-horizontal position;

a handle coupled to the threaded rod to facilitate rotation of the threaded rod, the handle being slidable along a portion of the threaded rod; and

20 an engaging member resiliently engaging the threaded rod to resiliently resist sliding of the handle, under the weight of the handle, along the threaded rod when the threaded rod is in the non-horizontal position.

20. The suspension system of claim 19, wherein the engaging member is a leaf spring.

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21. The suspension system of claim 19, wherein the engaging member is a leaf spring that resiliently engages threads of the threaded rod and deflects upon the application of external forces to allow the handle to slide relative to the threaded rod.

22. The suspension system of claim 19, wherein the engaging member
deflects and allows the handle to slide relative to the threaded rod when external forces
greater than the weight of the handle are applied to the handle, and wherein the engaging
member resiliently engages the threaded rod to resist sliding of the handle relative to the
5 threaded rod upon removal of the external forces from the handle.